

DESIGN THEORIES AND METHODS AT BERKELEY

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A COMPREHENSIVE HISTORY OF THE DISCIPLINE OF DESIGN THEORIES and methods has yet to be written, but there is no doubt that the Department of Architecture at Berkeley, its students and faculty, played and continue to play a significant role in the development of this relatively young field. At the core of the discipline are such questions as, What is design? How is design possible? What is the nature of design problems? How do designers reason? What kind of knowledge do they use, and how is that knowledge structured, and/or acquired? What procedures do designers follow and what is the logic of these procedures?

The discipline has its origin in the recognition, perhaps first articulated by Viollet-le-Duc in 1872, that design problems are becoming so complicated that they escape the designer's intuitive grasp:

It must needs be confessed that modern architects, surrounded as they are by prejudices and traditions and embarrassed by historical confusion in respect to their art, are neither inspired by original ideas or guided by definite and well understood principles; a fact the more plainly betrayed the more elaborate and complex are the monuments they are called upon to design and execute.¹

In its modern form, the discipline may be traced back to WWII when complex military logistical problems required new planning and decision-making tools. For this purpose, mathematical procedures were developed that today are known by such names as operations research or systems engineering. Soon similar approaches took hold of the field of design as witnessed by such texts as *Introduction to Design* by Morris Asimow,² professor of Engineering at UCLA, *Product Design and Decision Theory* by Kenneth Starr,³ professor of Production Management at Columbia University; and Christopher Alexander's *Notes on the Synthesis of Form*.⁴ The emerging discourse on design theories and methods crystallized and established itself as a discipline at the first conference on design methods, the "Conference on Systematic and Intuitive Methods in Engineering, Industrial Design, Architecture and Communication" held in London in September 1962.⁵ As the title of the conference suggests, design was then recognized as an activity that transcended professional boundaries.

The conference brought together a variety of researchers and designers from Europe and the US. UC Berkeley was represented by architecture professor Joseph Esherick, who delivered a paper on the "Problems of the Design of a Design System," which forebode a new vision for architectural education at Berkeley.⁶ One of the models for this vision was the avant-garde Hochschule für Gestaltung (HfG) in Ulm, Germany, a school of design that Esherick, James Prestini, and other Berkeley faculty had visited. The HfG was officially inaugurated in 1955 and was meant to be a revival of the Bauhaus. To contribute to the

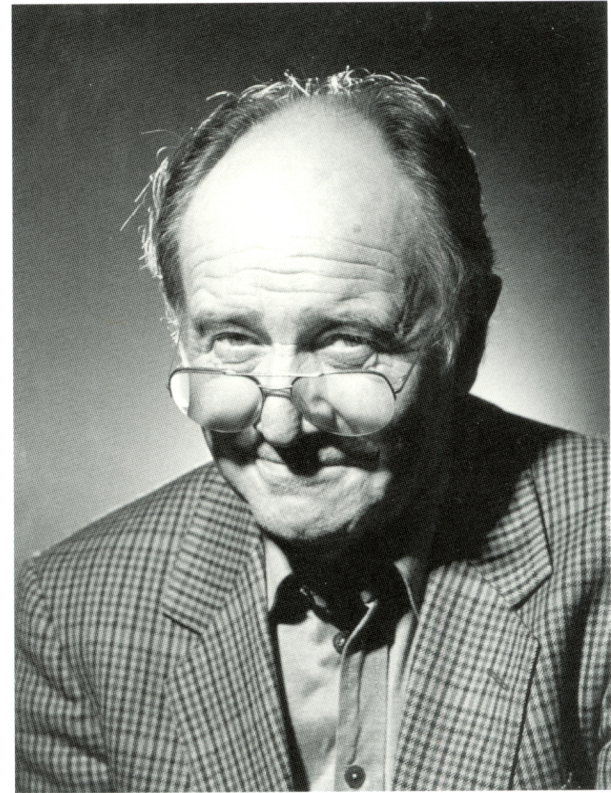
formulation and implementation of the new vision, Berkeley invited —among others—Horst W. J. Rittel, one of a triumvirate of directors at the HfG, and Christopher Alexander, recently out of Harvard, to join the architecture faculty. The year was 1963.

In 1966, about two years after the Department of Architecture had moved out of its “Old Ark” building to its new home within the College of Environmental Design in the newly built Wurster Hall, the faculty established a new curriculum including a one-to-three year graduate program with an option in Design Theories and Methods. This option included courses and seminars on the psychology of perception and communication (Charles Rusch), on problem solving procedures and operations research models (Horst Rittel), on program development and evaluation procedures (Roslyn Lindheim), on methods of architectural research (Sim Van der Ryn), on the integrated specification of environmental structures (Christopher Alexander) and on design methods for specific environmental problems (Joseph Esherick). To this assortment of courses were added design studios with an emphasis on design methods when I joined the faculty in 1968. At about the same time, we witnessed the advent of computer graphics, which brought new challenges and new directions for research to the discipline, and new courses to the curriculum.

Berkeley made its influence felt on the discipline from the very beginning. In the same year that the new curriculum took hold, Gary T. Moore, then a BArch student, co-founded the *International Design Methods Group*. This group was an eclectic one, comprising among its early members such luminaries as Denise Scott Brown, Ada Louise Huxtable, and Jay Doblin. Moore also founded and edited the *Design Methods Group Newsletter*, a monthly published out of Berkeley that reported on research and development in the field of design theories and methods.

The defining moment for design theories and methods at Berkeley came with the publication in 1972 of Horst Rittel and Melvin Webber’s seminal article “Dilemmas of a General Theory of Planning.”⁷ With this article, Rittel and Webber shattered the foundations upon which the discipline had been built, namely the model of Technical Rationality, as Donald Schön would call it a decade later. This model “which most powerfully shaped both our thinking about the professions and the institutional relations of research, education, and practice” held that the “professional activity consists in instrumental problem solving made rigorous by the application of scientific theory and technique.”⁸ In “Dilemmas ...” Rittel showed that design and planning problems differ significantly from scientific problems and that their characteristics put them outside the realm of scientific theory, and beyond the reach of systematic procedures, even rationality. Rittel called design and planning problems “wicked problems.”

The “Dilemmas of a General Theory of Planning” caused a momentous “shift in paradigm,” to use a Kuhnian notion. To distinguish this new approach from the model of Technical Rationality, Rittel spoke of a Second Generation of Design Theories and Methods. The model of Technical Rationality, or First Generation approach, assumed design problems to be technical problems. It further postulated that specific professional knowledge and expertise existed—or could be developed—that would suffice for the resolution of these problems. The Second Generation approach recognized design problems to be political problems, political in the sense that they dealt with allocation and distribution of resources and that solutions to design problems affected many people and in different ways. There exists no specific expertise to resolve political, i.e. wicked problems. The required knowledge is “not concentrated in a single head;” it is distributed in unknown ways and “over many people.”⁹



Horst Rittel
Faculty portraits, CED Records, EDA,
Berkeley

The paradigm shift did not come about abruptly. Rittel already had laid cornerstones to it at Ulm.

[Rittel] had argued that dichotomies purporting to distinguish systematic versus intuitive, and rational versus non-rational design are untenable. Rather, he asked, to what degree can and should design processes be made explicit, and to what extent can and should they be made communicable to others. For only communicable processes can be taught, and only explicitly formulated processes can be critically scrutinized and improved upon.¹⁰

Rittel's ideas fell on fertile ground at Berkeley, where he found new colleagues and students who challenged and inspired him. Perhaps the most influential colleague was C. West Churchman, a philosopher and professor in the School of Business Administration.¹¹ As director of the Social Sciences Program of the Space Sciences Laboratories, Churchman had organized what became known simply as the Churchman Seminar, a seminar on design. The premises for this seminar were that design is a ubiquitous activity in which most people engage, at least some of the time, and that there may be some generalizable observations to be made about how people go about it. To this effect the seminar assembled people from across campus and across disciplines: Music, Engineering, Political Science, Public Health, Art, Education, Architecture, City and Regional Planning, and more. It was in this seminar that Rittel first presented his notion of design problems as "wicked."

Development of the Second Generation approach became the focus of Rittel's work and of the research and teaching agendas at Berkeley. Crucial to the Second Generation was the understanding of design as an argumentative, or deliberative, process. Designers were seen to argue with themselves and with others about the appropriateness of a course of action. Much research by both faculty and students concentrated on finding ways of making this deliberation explicit, on understanding its structure and its logic, on supporting it, and on strengthening the process in making it more powerful and more controllable. Many students graduated having conducted original work in the field and went on to teach and practice throughout the world.

Today, Design Theories and Methods at Berkeley is in transition. As older faculty have retired or passed away, new faculty have joined the ranks and new directions are emerging and developing. As of 2004, the core faculty is comprised of C. Greig Crysler, Yehuda Kalay, Mike W. Martin and myself. The questions that spurred the discipline 50 years ago are still with us, yet the context is changing and requires different approaches and perspectives.

Greig Crysler's research examines the interplay between architectural theory and its wider institutional and social contexts. This has led to studies of architectural education, research, and professional practice that question and redefine the agenda of theory, particularly in relation to the issues surrounding globalization and the politics of cultural identity.

Yehuda Kalay's current research focuses on performance-based design, semantically rich representation, multi-disciplinary collaborative design, the nature of design knowledge, design decision making, design process management, conceptual design tools, and human-computer interface.

Mike W. Martin is exploring the factual and empirical base of management and leadership knowledge, skills, and values involved in the execution of architectural projects through a series of *building stories*, that is, case studies that analyze projects in practice.

My own research has expanded to include the application of design theories and methods to the investigation and study of ancient architecture, in particular that of the pre-Columbian peoples of the Andes. The questions raised are what can we learn from ancient representations of architecture and architectural remains about the design thinking, management, and construction practices of their creators?

Students and faculty in the discipline meet every so often to review the history of the field and to discuss and outline the research agendas of the future. Design theories and methods are well and alive at Berkeley.

Eugene-Emmanuel Viollet-le-Duc, *Discourses on Architecture*, trans. Henry Van Brunt (Boston: J.R. Osgood and Co., 1875).

² Morris Asimow, *Introduction to Design* (Englewood Cliffs, NJ: Prentice-Hall, 1962).

³ Martin Kenneth Starr, *Product Design and Decision Theory* (Englewood Cliffs, NJ: Prentice-Hall, 1963).

⁴ Christopher Alexander, *Notes on the Synthesis of Form* (Cambridge, MA: Harvard University Press, 1964).

⁵ J. Christopher Jones and D.G. Thornley, eds., *Conference on Design Methods, Papers* (Oxford, New York: Macmillan, 1963).

⁶ Jones and Thornley, *Conference on Design Methods, Papers*, 75-82.

⁷ *Policy Sciences* 4 (1973): 155-169.

⁸ Donald Schön, *The Reflective Practitioner: How Professionals Think in Action*. New York: Basic Books, 1983, 21.

⁹ Horst Rittel. "On the Planning Crisis: Systems Analysis of the First and Second Generation." *Bedriftsokonomien*, 34.8 (1972): 394.

¹⁰ C. West Churchman, Jean-Pierre Protzen, and Melvin M. Webber, "Horst W.J. Rittel, Architecture: Berkeley, 1930-1990, Professor of the Science of Design," *In Memoriam* (1992), <http://bibpurl.oclc.org/web/14771>.

¹¹ Today the Haas School of Business.

DESIGN ON THE EDGE

A Century of Teaching Architecture at the University of California, Berkeley, 1903-2003

